DOCUMENT RESUME

ED 306 025 PS 017 957

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TITLE Developmental Comparisons of the Consequences for Memory of Spontaneous vs. Controlled Imaginal Elaborations.
SPONS AGENCY Spencer Foundation, Chicago, Ill.
PUB DATE Apr 89
NOTE 15p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Kansas City, MO, April 27-30, 1989).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adults; *Age Differences; Children; *Classification; Cognitive Processes; Difficulty Level; *Encoding (Psychology); *Imagery; *Memory; *Performance Factors
IDENTIFIERS *Representational Response

ABSTRACT

Two studies compared the effects of spontaneous and controlled imagery on reality monitoring decisions. Reality monitoring refers to the decision processes involved in discriminating perceptual memories from imaginal ones. In Experiment 1, 6-year-olds and adults were shown pictures and words and they responded to one of two questions: (1) "What is this object for?" or (2) "How long would it take an artist to draw a picture of this object?" When asked whether each item was presented as a picture or word, all subjects were more likely to claim that a word was presented as a picture than that a picture was presented as a word. This pattern of confusion suggests that subjects are generating images implicitly when answering function questions, and they later misclassify these imaginal memories as pictorial ones. A study comparing the effects of implicit and explicit imagery generation, Experiment 2 showed that this misclassification/confusion is reduced among 6-year-olds, 9-year-olds, and adults when they generate images explicitly, when prompted to do so by the experimenter. It is concluded that, as the representational processes of children and adults are more similar than is commonly believed, the findings have implications for developmental theories about children's imaginal processes. (Author/RH)

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ED306025

Paper presented at the Meetings of the Society for Research in Child Development, Kansas City, April, 1989

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Developmental Comparisons of the Consequences for Memory of Spontaneous vs. Controlled Imaginal Elaborations

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This research is supported by a grant from the Spencer Foundation

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Abstract

Reality Monitoring refers to the decision processes involved in discriminating perceptual memories from imaginal ones. These studies compare the effects of spontaneous and controlled imagery on reality monitoring decisions. In Experiment 1, subjects (6 year olds and adults) were shown pictures and words and they responded to one of two questions: (1) "What is this object for?" or (2) "How long would it take an artist to draw a picture of this object?" When asked whether each item was presented as a picture or word, all subjects were more likely to claim a word was presented as a picture than a picture was presented as a word. This confusion pattern suggests that subjects are generating images implicitly when answering function questions, and they later misclassify these imaginal memories as pictorial ones. Experiment 2 shows this misclassification confusion is reduced when subjects (6 year olds, 9 year olds, and adults) generate images explicitly, prompted by the experimenter. These results have implications for developmental theories about children's imaginal processes.

A common assumption about children is that they are more confused than adults about the origin of their memories (Piaget, 1929; Werner, 1948). For example, it is assumed that children are more likely to confuse memories for what they saw with memories for what they imagined (e.g., Werner, 1948). Presumably this confusion between perceptual and imaginal memories stems from several sources. Children's thought processes are characterized as pictorial in form whereas adults are characterized as more abstract and schematic (e.g., Bruner, Olver, & Greenfield, 1966; Kosslyn & Bower, 1974; Piaget & Inhelder, 1971). In addition, children are thought to embellish their memories more than adults and later confuse these embellishments with reality (e.g., Flavell, Flavell, & Green, 1983).

In fact, adults will sometimes exhibit confusions between what they saw and what they imagined. For example, Durso and Johnson (1980) reported that on some occasions adults will claim an item was presented as a picture when it was actually presented as a word. This confusion seems to occur because adults generate "implicit" images in response to words, under some orienting conditions, and they later misclassify these memories for implicit images as memories for pictures. In the Durso and Johnson study, this confusion was much more evident after subjects responded to questions about an object's function than to questions about how long it would take an artist to draw an object. Thus, orienting tasks affected the degree to which subjects were confused about what they saw (perceptual memories) and what they imagined. The decision processes involved in these sorts of discrimination are referred to as Reality Monitoring (Johnson & Raye, 1981).

When considering how children might be affected by orienting tasks that influence imaginal processing, the developmental literature leads to contradictory predictions. If children's encoding processes are more pictorial than adults (e.g., Bruner, et al., 1966; Kosslyn, 1978), and they embellish their memories more often than adults (e.g., Flavell, et al., 1983), then they should be more confused about memories in situations where orienting tasks prompt implicit imagery generation. However, the strategy development literature indicates that children younger than 9 do not engage in imaginal elaborative processing spontaneously, and when explicitly instructed to generate images, they still have difficulty doing so (e.g., McDaniel & Pressley, 1987; Weinert & Perlmutter, 1989). Thus, if children are less likely to generate images or are less successful in doing so, they may be less confused than adults about the origin of their memories. These possibilities were investigated in the present studies.

Experiment 1

Subjects (6 year olds and adults, N = 48) saw pictures and words on 5 x 7 in cards. As the experimenter presented each card, she verbalized the item and asked subjects to indicate using a scale from 1 to 5 how long it would take an artist (for children, their art teacher) to draw a picture of each object (the Artist Condition) or to indicate what each object was for (the Function Condition). There were 24 pictures and 24 words presented during this encoding phase; the items were counterbalanced so that each item occurred equally often as a picture or a word across subjects. The Snodgrass and Vanderwart (1980) norms for picture

complexity were used to select items with an equal number of simple and complex referents. Complexity was defined as the intricacy or detail in black and white line drawings (Snodgrass & Vanderwart, 1980). Following the orienting task, subjects were surprised with a memory test. They were asked to identify each of 96 test items as "old" or "new," and for the items called "old," they were asked to identify how the items were presented (as pictures or words).

Results

The memory test was scored for discrimination performance. For example, of the 24 pictures the subject saw, the subject might claim 20 were pictures, 2 were words and 0 were new. Of the 24 words, the subject might claim 10 were pictures, 12 were words, and 0 were new. The discrimination score is a proportion of correctly identified items (20 + 12) relative to those correctly recognized as old items (18 + 2 + 10 + 12) or .76.

Discrimination performance was comparable in the two conditions, and, for the two age groups. An analysis of variance showed that overall performance was better for complex materials ($M = .93$) than simple materials ($M = .90$), $F(1,44) = 9.27$, $p < .004$. Furthermore, discrimination performance was better for pictures indicating subjects were more likely to claim a word was a picture, $F(1,44) = 8.60$, $p < .005$, and this tendency was greater in the Function Condition than in the Artist Condition, $F(1,44) = 4.13$, $p < .05$. Thus, while we replicate the findings of Durso and Johnson (1980), unexpectedly this replication holds for young and old alike.

The Artist condition may actually make subjects examine the pictures more carefully, and, hence encode more relevant information to make reality monitoring decisions. This possibility was eliminated with subsequent analyses. As is clear in Table 1, discrimination performance for pictures did not vary with condition. In contrast, for words, performance was worse in the Function condition than in the Artist condition.

The memory test was also scored for simple recognition performance. An analysis of variance on hits (i.e., the number of pictures and words correctly recognized as old) showed only a main effect for age, $F(1,44) = 19.57$, $p < .001$. Mean hits were higher for adults (M = .95) than children (M = .86). The fact that recognition was equivalent for pictures and words is important, indicating that the greater confusion associated with words is not a reflection of poorer memory for the words. In addition, there was a significant interaction between presentation mode and orienting condition, $F(1,44) = 9.15$, $p < .004$ (see Table 2); hits on pictures and words were equivalent in the Function condition but they were greater on words in the Artist condition.

Experiment 2

In the second study, the effects of implicit and explicit imagery generation were compared. Subjects (6 year olds, 9 year olds and adults, N = 72) were asked the same function question used in Experiment 1 (Implicit Imagery condition) or they were told to generate an image for each item and then to rate how "good" the image was, using a scale from 1 to 5 (Explicit Imagery condition). The materials and general procedure were otherwise identical to Experiment 1, with one difference. The retention

interval in Experiment 2 was 5 min whereas in Experiment 1 the memory test immediately followed the completion of the orienting tasks.

Results

As in Experiment 1, discrimination performance was better for complex materials than simple materials, $F(1,66) = 5.10$, $p < .03$. Furthermore, discrimination performance varied for pictures and words; subjects were more likely to call a word a picture, $F(1,66) = 22.87$, $p < .001$, and this tendency was greater in the Implicit Imagery condition for all age groups, $F(1,66) = 21.43$, $p < .001$ (see Table 3).

Since the cognitive operations involved in generating images were more deliberate and controlled in the Explicit Imagery condition than in the Implicit Imagery condition, we expected adult subjects to be less confused in the former case. The results in Table 3 are consistent with this expectation. Discrimination performance was better in the Explicit Imagery condition than in the Implicit Imagery condition, $F(1,66) = 11.45$, $p < .001$ and this difference tended to be greater for adults than children, $F(2,66) = 2.81$, $p < .08$.

Analyses on mean hits indicated a main effect for age, $F(2,66) = 13.37$, $p < .001$ (see Table 4). Overall, recognition was actually higher for words than for pictures, $F(1,66) = 11.34$, $p < .001$. However, this pattern was evident only for children, producing an age x materials interaction, $F(2,66) = 4.25$, $p < .02$.

Conclusions

Our findings are important for several reasons. They suggest that the representational processes of children and adults are

more similar than is commmonly believed. The information subjects use to answer the Function question is perceptually- based, producing the confusions between pictures and words. If the form of information represented in memories varied with age, then there should have been developmental differences in this Function condition and there were not. Thus, while adults' representations may be more abstract and schematic than children's on occasion, this does not mean that adults' representations are always less perceptually-based or pictorial in form.

Furthermore, there is no evidence that children are more likely than adults to embellish their memories. Using discrimination performance as an index of the incidence of implicit imagery generation -- a type of embellishment -- children and adults seem to generate images automatically with equal frequency. If anything, our data suggest that adults' are the ones who are more likely to embellish their memories. In the Explicit Imagery condition, there was a tendency for adults to be less confused than children. This suggests that adults' memories may have been more elaborate, including additional cues that facilitated discrimination performance. Given that complexity was not involved in any interactions, the additional cues seem to be related to the cognitive operations involved in generating rather than the sensory information contained in the pictures.

References

Bruner, J.S., Olver, R.O., & Greenfield, P.M. (1966) Studies in cognitive growth. New York: Wiley.

Durso, F.T., & Johnson, M.K. (1980) The effects of orienting task on recognition, recall and modality confusion of pictures and words. Journal of Verbal Learning and Verbal Behavior, 19, 416-429.

Flavell, J.H., Flavell, E.R., & Green, F.L. (1983) Development of the appearance-reality distinction. Cognitive Psychology, 15, 95-120.

Foley, M.A., Santini, C., & Sopasakis, M. (1989) Discriminating between memories: Evidence for children's use of spontaneous elaborations. Journal of Experimental Child Psychology, in press.

Kosslyn, S.M. (1978) The representational-development hypothesis. In P. Ornstein (Ed.), Memory Development, New Jersey: Lawrence Erlbaum.

Kosslyn, S.M., & Bower, G.H. (1974) The role of imagery in sentence memory: A developmental study. Child Development, 45, 30-38.

Johnson, M.K., & Raye, C.L. (1981) Reality Monitoring. Psychological Review, 88, 67-85.

McDaniel, M.A., & Pressley, M. (1987) Imagery and related processes. New York: Springer-Verlag.

Piaget, J. (1929) The child's conception of the world. New York: Harcourt, Brace.

Piaget, J., & Inhelder, B.I. (1971) Mental imagery in the child. New York: Springer Publishing Co.

Snodgrass, J.G., & Vanderward, M. (1980) A standardized set of 260 pictures: Norms for name agreement, image agreement, familiarity and visual complexity. Journal of Experimental Psychology: Human Learning and Memory, 5, 607-617.

Weinert, F.E., & Perlmutter, M. (1988) Memory development New Jersey: Lawrence Erlbaum.

Werner, H. (1948) Comparative psychology of mental development. New York: International University Press.

Table 1. Mean Discrimination Scores, Experiment 1

	Orienting Condition	
	Function	Artist
Presentation Mode		
Picture	.94	.94
Word	.85	.92

Table 2. Mean Hits, Experiment 1

	Orienting Condition	
	Function	Artist
Mode of Presentation		
Picture	.92	.88
Word	.91	.92

Table 3. Mean Discrimination, Experiment 2

	6 yr olds	9 yr olds	Adults
Implicit Imagery			
Pictures	.94	.95	.99
Words	.79	.83	.70
Mean	.86	.89	.85
Explicit Imagery			
Pictures	.88	.94	.99
Words	.93	.89	.97
Mean	.91	.91	.98

Table 4. Mean Hits, Experiment 2

	6 yr olds	9 yr olds	Adult
Presentation Mode			
Pictures	.85	.90	.97
Words	.92	.94	.97